

The Distance to the Pleiades Cluster

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Abstract

The brightest binary star in the Pleiades cluster, Atlas, has been resolved by the Palomar Testbed IR Interferometer and the Mark III Optical Interferometer. For such bright, B8 type of giant star, however, there is no correct spectroscopic results available. Now interferometric observations have determined all of seven orbital parameters independently and accurately. In addition, the magnitude differences between two components are measured as 1.68 ± 0.07 mag at V band, and 1.92 ± 0.06 mag at K band, which yield the color indexes (V - K) of -0.14 ± 0.07 mag for the primary, and -0.36 ± 0.08 mag for the companion. The observations of lunar occultation demonstrate consistent results of angular separation and photometry with that from interferometry. It is surprising to learn that the Hipparcos astrometric satellite has determined the orbit of this close system also. Unfortunately, the orbit from the Hipparcos mission is wrong. Since the primary is a B8 III giant, and the companion is a B8 main-sequence star. Thus the total mass of the system is definitely larger than $6M_{\odot}$, and the corresponding orbital parallax indicate that the distance to the Pleiades from the Hipparcos (116 ± 3 pc) is not correct.